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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* MICHEL STREBELLE

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Appeal 2010-009195  
Application 10/567,263  
Technology Center 1700

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Before CHARLES F. WARREN, LINDA M. GAUDETTE, and  
MARK NAGUMO, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicant appeals to the Board from the decision of the Primary Examiner finally rejecting claims 10-23 in the Office Action mailed October 29, 2009 (Office Action). 35 U.S.C. §§ 6 and 134(a) (2002); 37 C.F.R. § 41.31(a) (2009).

We affirm the decision of the Primary Examiner.

Claim 10 illustrates Appellant's invention of a process for regenerating a spent hydrogenation catalyst used in a specified process, and is representative of the claims on appeal:

10. A process for regenerating a spent hydrogenation catalyst comprising at least one catalytic metal selected from the group consisting of Ru, Rh, Pd, Os, Ir and Pt on an inert support, wherein the spent catalyst has been used in a hydrogenation reaction of acetylene present in a gas mixture consisting essentially of HCl obtained from the pyrolysis of 1,2-dichloroethane, wherein the process consists essentially of a thermal treatment of said spent hydrogenation catalyst in the presence of oxygen at a temperature of between 300 and 700 °C.

Appellant requests review of the ground of rejection under 35 U.S.C. § 103(a) advanced on appeal by the Examiner: claims 10-23 over Vollheim (DT 24 38 153 A1)<sup>1</sup> in view of Welty (US 2,368,507). App. Br. 4; Ans. 3.

Appellant states that “all claims stand or fall with claim 10,” and thus, we decide this appeal based on claim 10. Br. 6. 37 C.F.R. § 41.37(c)(1)(vii) (2009).

### Opinion

The dispositive issue raised by Appellant’s position is whether the Examiner erred in refusing to accept Appellant’s evidence of failure of others to regenerate a hydrogenation catalyst, as claimed in claim 10, as evidence of nonobviousness of the claimed process for regeneration of that hydrogenation catalyst.

#### I.

There is no dispute that Vollheim would have disclosed to one of ordinary skill in the art a process in which a hydrogenation catalyst

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<sup>1</sup> We refer to the abstract of Vollheim prepared by Chemical Abstracts (DN 84:164120 (1976)) (Vollheim Abstract), filed by Appellants on June 5, 2006, and an automated translation prepared by the European Patent Office, entered in the record by the Examiner on June 17, 2009 (Vollheim EPO automated translation), both documents referred to in the ground of rejection. Ans., e.g., 4; *see* Office Action, e.g., 3. Appellant does not contend that these documents do not reflect Vollheim’s disclosure.

comprising at least one “platinum metal” deposited on an inert support, such as palladium on silica, is used in a fixed-bed reactor to hydrogenate the alkyne acetylene in gaseous HCl to the alkene ethylene, wherein the acetylene containing HCl gas is obtained from dehydrochlorination of 1,2-dichloroethane. *See* Vollheim Abstract, and Vollheim EPO automated translation, e.g., 2. App. Br., e.g., 4. We notice that the term “platinum metal” has the common, technical dictionary meaning of a group of six metals of the group VIII metals, which are those metals specified in claim 10.<sup>2</sup> *See* Ans. 8.

We find in the Vollheim Abstract the statement that “a fixed-bed Pd-SiO<sub>2</sub> catalyst of low porosity” is used in the process, and that “the catalyst was easily regenerated, as there was very little carbonization as compared to conventional porous catalysts.” We find in the Vollheim EPO automated translation the statement: “A regeneration of the fixed bed catalyst brauchten [sic] in the invention process is to be accomplished economic worthwhile and technical light. The life of the fixed bed katalyeators [sic] in the method in accordance with invention is a mebrfaches [sic] prolonged around like that of the known catalyst.” Vollheim EPO automated translation 3:4-6.

We find that Welty would have disclosed to one of ordinary skill in the art that hydrogenation catalyst used in catalytic reactions such as, among other things, cracking and reforming of hydrocarbon oils, which also involve, among other things, polymerization and isomerization, “gradually lose their activity” and can be regenerated in air or oxygen at high temperatures between 1050-1100°F, that is, 566-593°C, “to cause

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<sup>2</sup> *See, e.g.,* platinum metal, *Hawley’s Condensed Chemical Dictionary* 887 (14th ed., Richard J. Lewis, Sr., revisor, John Wiley & Sons, Inc., 2001).

combustion of the carbonaceous material deposited upon them during the catalytic reaction.” Welty col. 1, ll. 1-15, and col. 1, l. 55 to col. 2, l. 2; *see also* col. 1, l. 48 to col. 3, l. 56, and col. 4, ll. 64-68. *See* Ans. 4 and 8. The catalysts that can be regenerated can have metals, including, among other things, metals of group VIII, such as nickel, on silica and alumina supports. Welty col. 1, ll. 23-36. We determine that one of ordinary skill in the art would have reasonably inferred from the cracking, reforming, and other hydrogenation reactions disclosed in Welty<sup>3</sup> that the same would include the well known hydrocracking and hydroforming reactions with petroleum materials, such as the isomerization of alkene hydrocarbons to branched chain alkane hydrocarbons, which are conducted in the presence of hydrogen and a hydrogenation catalyst.<sup>4</sup>

## II.

In view of the evidence in the combined disclosures of the Vollheim Abstract and EPO automated translation and Welty, we agree with the Examiner that the teachings of Vollheim and Welty would have led one of ordinary skill in the art to combine the references leading to the use of Welty’s catalyst regeneration process for the catalysts used in Vollheim’s process. Ans. 3-4. Indeed, the Vollheim Abstract describes Vollheim’s catalysts as gradually losing activity because of carbonization buildup during

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<sup>3</sup> It is well settled that a reference stands for all of the specific teachings thereof as well as the inferences one of ordinary skill in the art would have reasonably been expected to draw therefrom, *see, e.g., In re Fritch*, 972 F.2d 1260, 1264-65 (Fed. Cir. 1992); *In re Preda*, 401 F.2d 825, 826-27 (CCPA 1968), presuming skill on the part of this person. *In re Sovish*, 769 F.2d 738, 743 (Fed. Cir. 1985).

<sup>4</sup> *See, e.g.,* hydrocracking, hydroforming, *Hawley’s Condensed Chemical Dictionary* 585 and 586 (14th ed.).

hydrogenation of the alkyne acetylene to the alkene ethylene, and Welty's process regenerates the same and similar catalysts which gradually lose activity because of carbonization buildup during, for example, hydrogenation of an alkene to an alkane, by removing the carbonaceous material through combustion.

III.

A.

Appellant submits that contrary to Vollheim's disclosure that catalysts used in the process described therein can be easily regenerated, "those of ordinary skill in the art, including the authors of Vollheim, knew otherwise," and thus, Appellant argues, the surprising discovery that catalysts used in Vollheim's process can be regenerated "satisfactorily" as claimed in claim 10 is "deserving of patentability." App. Br. 5, 6, and 7. Appellant contends that "[i]n service, . . . [Vollheim's] catalyst undergoes gradual deactivation and, although Vollheim states, without more, that the catalyst can be regenerated, in practice attempts at such regeneration have proved to be fruitless, owing in particular to the contamination of this catalyst with heavy metals." App. Br. 5, citing Spec. 1:17-25, and the article "H. Müller et al., Chem.-Ing.-Tech, 59 (1987) No. 8, pp. 645-7" (Müller article). Appellant contends that the Müller article supports the statement in the Specification that contamination of the catalyst with heavy metals renders regeneration "fruitless." App. Br. 6-7, citing Spec. 1:22-25.

We find that the Müller Abstract<sup>5</sup> states that "[s]electivity increased

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<sup>5</sup> Appellant filed an "English Abstract" of the Müller article prepared by Chemical Abstracts (DN 107:198949 (1987)) (Müller Abstract) on June 5, 2007. App. Br. 5.

with increasing use time for hydrogenation catalyst E 39H with a maximum 76% selectivity attained after 4 yr” and that “[c]atalyst selection and the hydrogenation mechanism were discussed,” but provides limited process information. We further find that the Müller Abstract does not otherwise identify the catalyst or its condition at the end of 4 years. We find that Appellant discloses that “[t]he invention is illustrated non-limitatively” by an example wherein the “[c]atalyst E39H (beads of silica . . . with 0.15% of Pd supported at the surface . . . ) sold by Degussa and as described by Müller, was used for four and a half years” under certain process conditions. Spec. 5:10-17.

B.

Appellant contends that after being unable to regenerate a catalyst used in Vollheim’s process, Appellant “turned to Vollheim’s employer for direction: Degussa,” and “[i]n response, Appellant receive a letter from Degussa informing them [sic] that ‘no catalyst regeneration [is] possible,’ recommending instead replacement with fresh catalyst.” App. Br. 7, citing the Degussa letter dated 12/7/2000 and its English translation (Degussa translation).<sup>6</sup>

We find that in the Degussa translation, a technical representative of Degussa states that the “used E39H catalyst” was inspected and found to “come[] from our last delivery of 1992.” Degussa translation 1. We find that after “[v]isual assessment,” “[c]arbon deposits (quantitative C-assessment),” “[s]emi-quantitative x-ray fluorescence analysis (XFA),” and “[l]aboratory performance test,” it is further stated that “[t]he catalyst shows

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<sup>6</sup> These documents were filed March 9, 2009.

considerable deposits on the upper surface (carbon deposits),” which “deposits cannot be removed through simple sieving procedures or washing measures.” Degussa translation 1. We find that it was stated with respect to the “quantitative C-assessment” that “E 39 H Solvin” had a “[h]igh proportion of carbon deposits” compared to “[f]resh catalyst.” Degussa translation 1. We find that it was further stated with respect to the “[s]emi-quantitative XFA,” that as compared to “[f]resh E 39 H catalyst,” the “[u]sed Solvin catalyst” had “[m]oderate increase in Fe load (Fe = catalyst poison),” “Cl deposits [(inorg.)] point to a high proportion of surface deposits,” and “[t]races” of “Co/Zn/Cu/Ti/Pb/Zr” were reported. Degussa translation 1-2 and first table. We further find the following “Summary (assessment):”

The Solvin catalyst that was inspected is a very inactive catalyst with a high level of carbon depositing on the surface. There is no unusual poisoning. Consequently the Solvin catalyst shows the signs of a catalyst which on the basis of its time in service has experienced a deactivation through surface deposits typical for this type of catalyst as a consequence of ageing. These surface deposits cannot be removed through simple washing or filtering procedures (no catalyst regeneration possible). The recommendation therefore is to replace the reactor charge with a fresh catalyst.

Degussa translation 2.

### C.

Appellant submits that after receiving the Degussa letter, the claimed method was discovered, which was “completely surprising and unexpected in view of the clear belief to the contrary of those skilled in the art.” App. Br. 7-8, citing Appellant Strebelle’s Declaration (Strebelle Declaration) ¶ 6.<sup>7</sup>

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<sup>7</sup> Declaration of Michele Strebelle executed March 9, 2009, and filed on that date.



Appellant argues that Welty's process "used to regenerate other types of spent catalysts" should not affect the patentability of the claimed invention which regenerates catalysts that have become spent by being used in the hydrogenation of acetylene under the conditions specified in claim 10. App. Br. 8 (original emphasis deleted), citing Strebelle Decl. ¶ 6. Appellant contends that the spent catalysts regenerated by Welty were "used in cracking, reforming, dehydrogenation, aromatization, and the like," and thus does "not negate patentability herein, or lessen the importance of Appellant's secondary objective evidence of the failure of others." App. Br. 8 (emphasis original), citing Strebelle Decl. ¶ 7; *see also* App. Br. 9, n. 5, 10, and 11, citing Strebelle Decl. ¶ 7.

We find that Appellant Strebelle attests that the Degussa "letter specifically states 'no catalyst regeneration possible', recommending instead replacement with fresh catalyst." Strebelle Decl. ¶ 5. We find that Appellant Strebelle attests that

I have found, surprisingly, that the regeneration of the particular spent hydrogenation catalyst described in my application can be accomplished by thermal treatment in the presence of oxygen. This finding is completely surprising in view of the clear prior belief by others that it was not possible to regenerate such catalysts. The fact that thermal treatment has been used to regenerate other types of spent catalysts does not in any way predict or suggest that thermal treatment in oxygen would be successful in the regeneration of catalysts that have become spent by being used in a hydrogenation reaction of acetylene present in a gas mixture consisting essentially of HCl that has been obtained from the hydrolysis of 1,2-dichloroethane.

Strebelles Decl. ¶ 6 (emphasis original).

We further find that Appellant Strebelle further attests that

Because the catalysts of my invention and [Vollheim] are used in a different reactive environment, and for a completely different reaction (hydrogenation), as compared with the Welty catalysts, the materials and conditions responsible for the decrease in catalytic activity of the Welty catalysts, which must be reversed/removed in order to provide regeneration, are completely different from and unrelated to those of my invention and [Vollheim].

Strebel Decl. ¶ 7 (emphasis original).

#### IV.

On this record, we are of the opinion that Appellants have not carried the burden of establishing that one of ordinary skill in the art routinely considering the combined teachings of Vollheim and Welty would have reasonably recognized that Welty's process of regenerating a hydrogenation catalyst containing a Group VIII metal on an inert support used in a different process of hydrogenating unsaturated carbon compounds could not be successfully used to regenerate a hydrogenation catalyst containing the same Group VIII metals on the same inert support used in Vollheim's process.

Considering first the Müller letter, we agree with the Examiner that Appellant has not established that in fact Müller would have disclosed to one of ordinary skill in the art that Degussa's E 39H catalyst cannot be regenerated by any manner of process after it becomes spent in Vollheim's process. Ans. 6-7. Indeed, such a teaching is not reflected in the Müller translation. We, like the Examiner, further find no evidence supporting Appellant's position in the Degussa letter translation. Ans. 7. Indeed, the sole regeneration techniques set forth therein are simple washing and filtering procedures, and thus there is no reasonable factual basis to support a finding that the statement "no catalyst regeneration possible" encompasses

any regeneration process that one of ordinary skill in the art would have found in the prior art, as Appellant contends. There is support in the Degussa letter for the Examiner's finding that "Degussa 'recommends' replacement with fresh catalyst . . . does not mean regeneration is impossible, just that it may be more efficient to use fresh catalyst instead."

Ans. 7. Indeed, Degussa would have been interested in selling the E 39H catalyst.

Accordingly, on this record, we determine that the evidence in the Müller letter, as reflected in the Müller translation, and in the Degussa letter, as reflected in the Degussa translation, does not support Appellant Strebel's opinion that there was "clear prior belief by others" that the catalysts used in Vollheim's process cannot be regenerated, which opinion is thus entitled to little, if any, weight. *See, e.g., Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d at 1368 ("[T]he Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations." (citations omitted)); *In re Etter*, 756 F.2d 852, 860 (Fed. Cir. 1985) (en banc) (opinion affidavit asserting the reference disclosed obsolete technology was correctly characterized by the board "as merely representing opinion[] unsupported by facts and thus entitled to little or no weight." (citations omitted)).

We further cannot agree with Appellant's contention that the claimed process is nonobvious over the combined teachings of Vollheim and Welty because of the difference in the reactions in which the spent catalysts regenerated by the claimed process and that of Welty are used. As the Examiner points out, the catalysts regenerated following Welty's teachings contain the same components as the catalysts disclosed by Vollheim and

encompassed by claim 10, and are used in similar hydrogenation processes to that in Vollheim as specified in claim 10 wherein carbonaceous material buildup results in the catalyst being deactivated or “spent.” Ans., e.g., 8. Appellant has not adduced evidence or scientific reasoning establishing that the moderate presence of Fe poisoning of the Degussa E 39H catalyst, as set forth in the Degussa letter, would have reasonably been expected to interfere with removal of the carbonaceous material from the catalyst by combustion in oxygen as taught by Welty. Accordingly, Appellant’s unsupported conclusory statements in the Specification and Strebelle Declaration are entitled to little, if any, weight. *See, e.g., In re Lindner*, 457 F.2d 506, 508 (CCPA 1972) (“mere conclusory statements in the specification and affidavits are entitled to little weight when the Patent Office questions the efficacy of those statements” (citations omitted)).

V.

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in the combined teachings of Vollheim and Welty with Appellant’s countervailing evidence of and argument for nonobviousness and conclude, by a preponderance of the evidence and weight of argument, that the claimed invention encompassed by appealed claims 10-23 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

The Primary Examiner’s decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

Appeal 2010-009195  
Application 10/567,263

AFFIRMED

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